ABSTRACT

An image forming apparatus, toner cartridge assembly and toner hopper uses a seal-insert and tear-style seal-assembly in the toner hopper as used in toner cartridge assemblies for dry toner style printers, copiers and facsimile machines. The seal-insert is provided a substantially stiff layer to provide support of the seal-assembly during the manufacturing and installation process. The seal-insert includes a top adherent layer and a bottom adherent layer. The top adherent layer is used to adhere a layer-to-be-torn to the seal-insert while the bottom adherent layer may use a protective liner to protect its adhesive properties until the time when the seal-assembly is installed into a toner hopper. The bottom protective liner may optionally be a rigid material. An adherent layer may be added over the layer-to-be torn for seal-assembly installation. The seal-insert's stiff layer is for better installation support, and the support may be either internal, external or both. The external stiff support may be removed after seal-assembly is installed. The seal-assembly may include components made from an antistatic and/or a conductive material, for example, an aluminum laminate or seal-material impregnated with conductive particles. Alternately, the components may be made from material covered with an antistatic and/or conductive spray or coating. The tear-style seal may be provided with an optional tear-guide secured to and under the tear-sheet. The tear-guide includes a width smaller than the tear-sheet and slightly smaller than the slot of the seal-insert. When the tear-guide is pulled at the using location, the tear-guide will rip the tear-sheet in a substantially straight line, providing an opening with an even width that will maximize toner flow. The tear-material may be multi-layer or a laminate and the tear-guide may also be a multi-layer or a laminate. Tear-seals may be made with and without a seal-insert. Pre-cuts may be implemented to predetermine and initiate the position where the tear of a seal is to go for any seal that uses a tear-guide and also for seals that do not use a tear-guide. Other tear-control means such as perforation may be provided in the tear-material. Instead of a tear-guide, the pull-strip may be made of the same material as the tear-material and contiguous with the tear-material. The seal-assembly may have a short grip portion where the seal installation personnel may pull on both the short grip portion and the pull-strip simultaneously to control and guide the seal-assembly into position in the toner hopper with ease. Methods to install and manufacture are also included.